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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,511	02/27/2007	Katja Berg-Schultz	21902US(C038435/0198732)	8417
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Bryan Cave LLP 1290 Avenue of the Americas New York, NY 10104			EXAMINER POURBOHLOUL, SARIIRA CAMILLA	
			ART UNIT 1796	PAPER NUMBER
			MAIL DATE 02/19/2010	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,511	<b>Applicant(s)</b> BERG-SCHULTZ, KATJA	
	<b>Examiner</b> S. CAMILLA POURBOHLOUL	<b>Art Unit</b> 1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 14-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/01/2006, 01/29/2010</u> . | 6) <input type="checkbox"/> Other: ____.  |

### DETAILED ACTION

Applicant's election without traverse of claims 1-13 (Group I) in the reply filed on October 15, 2009 is acknowledged.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Spange et al. (Angew. Chem. Int. Ed. 2002, 41, 10, 1729-1732).

Regarding claims 1-3, and 12, Spange et al. discloses a method of encapsulating chromophores wherein the encapsulated components show improved retention within the microcapsule due to a new sol-gel procedure (pg. 1729, left column, second paragraph). The first step of the encapsulation procedure involves the covalent modification of a trialkoxysilane with an organic (e.g. chromophoric) group (reads on the crosslinkable chromophore monomer of the instant invention) (pg. 1729, left column, second paragraph) in the absence of non-crosslinkable chromophores. More specifically, a fluorine atom in a chromophoric substance (e.g. fluorobenzophenone, a UV-A absorber) (pg. 1729, right column, first paragraph; Table 1) is substituted by a primary or secondary amine bonded to an alkoxysilane in tetraethoxysilane (TEOS)

(e.g. aminopropyltrimethoxysilane, APS). This functionalized trialkoxysilane is converted into an organically modified silica gel (i.e. sol-gel hybrid; page 1729, Scheme 1) by addition of tetraalkoxysilane (reads on the crosslinkable monomer of the instant invention) (pg. 1729, left column, third paragraph).

Regarding claims 4, 6, and 7, Spange et al. discloses a sol-gel process resulting in a sol-gel hybrid material (equivalent of the crosslinkable chromophore with UV filter activity) ( Scheme 1: page 1729, right column) is a crosslinkable monomer prepared by reacting a UV-A, UV-B, and/or UV-C chromophore such as a fluorinated benzophenone (equivalent of "P" of the general formula  $M(R)_n(P)_m(Q)_q$  of the instant invention) with a aminoalkylalkoxysilane (APS) to give rise to a chromophoric xerogel such as 4-fluorobenzophenone:aminopropyltrimethoxysilane (APS) (equivalent of the chromophore monomer of Ex. 1: (triethoxysilyl)propyloxyphenyl-benzoxazole, and equivalent of the  $M(R)_n(P)_m(Q)_q$  where M is a silicon element, R is hydrolysable group such as an alkoxides and Q is a non-hydrolyzable group such as an C<sub>1</sub>-C<sub>6</sub> alkyl group as cited in paragraph 18-26 of the specification) (page 1730, Table 1; page 1729, right column, first paragraph).

Regarding claim 5, Spange et al. discloses a sol-gel chromophore hybrid containing a chromophore with UV-A and/or UV-B filter activity such as fluorobenzophenone (page 1729, right column, first paragraph). The spacer group  $(B)_b(C)_c(D)_d(E)_e$  is optional because b, c, d, and e could be 0 or 1.

Regarding claim 8, Spange et al. discloses a sol-gel chromophore hybrid containing a silane with at least two C<sub>1-6</sub> alkoxy groups (fluorobenzophenone:aminopropyltrimethoxysilane) (page 1730, Table 1).

Regarding claim 9, Spange et al. discloses using a crosslinkable silane monomer in the process of sol-gel chromophore hybrid production, wherein the silane monomer is tetraethoxysilane (reads on at least two C<sub>1-6</sub> alkoxy groups of the instant claim) (page 1729, left column, third paragraph).

Regarding claim 10, Spange et al. discloses that when chromophoric substances such as 4-nitroaniline derivatives are incorporated into the silicate matrix, uniformly spherical particles with a narrow size-distribution of less than 2 $\mu$ m in diameter are formed (page 1729, right column, second paragraph; page 1731: figure 2).

Regarding claim 11, Spange discloses that the sol-gel materials prepared using this method contains up to 20% organofunctionalized silane (chromophoric silane) (pg. 1729, right column, second paragraph).

Claims 1-10, 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Avnir et al. (US 6,159,453).

Regarding claims 1-5 and 12, Avnir et al. discloses a method of preparing a sol-gel material with trapped sunscreen comprising condensation-polymerization of at least one monomer selected from metal alkoxides and from monomers of the formula M(R)<sub>n</sub>(P)<sub>m</sub>, wherein M is a metallic or semi metallic element (such as silicon, titanium, zinc, aluminum, zirconium) R is a hydrolyzable substituent (such as alkoxides,

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aryloxides, carboxylic esters, acyloxy groups, diketonato groups, hydrolyzable aza groups and chlorine),  $n$  is an integer from 2 to 6,  $P$  is a non polymerizable substituent (reads on the crosslinkable monomer of the instant invention) or a sunscreensing moiety or derivative (reads on the crosslinkable chromophore monomer of the instant invention) and  $m$  is an integer from 0 to 6, in the presence of at least one sunscreen ingredient, resulting in the entrapment of the sunscreen ingredients within the formed sol-gel matrix (col. 3, lines 33-46).

Regarding claims 6, 7, 9, and 13, Avnir teaches using a combination of tri- and tetra-alkoxysilane monomers (col. 4, lines 48-51; col. 5, lines 44-48) in the presence of basic or acidic catalysts for entrapping sunscreen agents such as cinnamate, salicylate, and benzophenone (col. 6, lines 8-27), as well as surfactants (col. 5, lines 51-67).

Regarding claim 8, Avnir et al. teaches chromophoric monomers of the formula  $M(R)_n(P)_m$ , with  $R$  being a hydrolysable group such as an alkoxides group and  $n$  is an integer from 2-6 (col. 3, lines 33-46) (reads on at least two  $C_{1-6}$  alkoxy groups of the instant claim).

Regarding claim 10, Avnir et al. discloses the sol-gel matrices are particles in the range of 0.01-100 microns in diameter (col. 3, lines 8-31).

Claims 1, 2, 4-9, 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakuta et al. (US 5,254,542).

Sakuta et al. discloses a method of preparing an organic silicon compound having a skeleton of UV absorbing agents such as benzotriazole or benzophenone (col.

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3, lines 44-50; col. 1, lines 65-67) comprising the steps of converting the UV absorbers to allyl derivatives (col. 2, lines 17-29); adding hydrosilane compounds with alkoxy group (results in an equivalent of the crosslinkable chromophore monomers of the instant invention) (col. 9, lines 21-40); and finally subjecting the reaction product to a hydrolysis reaction with an alkoxysilane such as trimethoxysilane (reads on the crosslinkable monomer of the instant invention) (col. 9, lines 60-64; col. 11, lines 13-18), wherein the UV absorber makes up from 1 to 33 mol% of the total moles of the organic group (col. 4, lines 19-26).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spange et al. (US 6,159,453) in view of Avnir et al. (WO 03/032959).

Spange remains as applied to claims 1-12 above. Although, Spange teaches a method of encapsulating chromophores with an improved sol-gel process, It fails to teach its product used in a sunscreen composition. However, Avnir et al. teaches a method of entrapping chromophore derivatives in a sol-gel composition wherein the product is utilized as a sunscreen composition (col. 3, lines 15-17). Avnir et al. teaches that due to the carcinogenic nature of chemical sunscreens, it is essential to isolate the chemical sunscreen agents from the body while retaining the sunscreen ability to absorb light (col. 1, lines 65-col.2, lines 1-5). Avnir et al. teaches that its sol-gel matrices are transparent to the UV radiation and thus allow light to reach the UV absorbing chromophores (col. 3, lines 18-22), while isolating the chromophores from skin, preventing its absorption and thus protecting the skin. Therefore, it would have been obvious to one of ordinary skill in the art to apply a UV absorbing agent as a sunscreen agent as taught by Avnir et al. to the transparent sol-gel matrix of Spange et al. in order to entrap and isolate the sunscreen agent from the body.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. CAMILLA POURBOHLOUL whose telephone number is (571)270-7744. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James J. Seidleck/

Supervisory Patent Examiner, Art Unit 1796

/SCP/